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UNITED STATES
ENVIRONMENTAL PROTECTION AGENCY

PROPOSED PLAN
for the

SUMMIT NATIONAL SUPERFUND SITE
DEERFIELD, OHIO

FEBRUARY 12, 1988

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I. INTRODUCTION

The U.S. Environmental Protection Agency (U.S. EPA) and the Ohio Environmental Protection Agency (Ohio EPA) recently completed a Feasibility Study (FS) for the Summit National Superfund site in Deerfield Township, Portage County, Ohio. The FS evaluated several options, or remedial alternatives, for addressing contamination problems at the site. Based on this evaluation, U.S. EPA has identified a preferred remedial alternative.

This Proposed Plan summarizes the remedial alternatives evaluated in the FS, and presents U.S. EPA's preferred remedial alternative. This Proposed Plan also summarizes the results of the Remedial Investigation (RI) that characterized the nature and extent of contamination problems at the site. The RI and FS reports will be available for review by February 12, 1988, at the U.S. Post Office in Deerfield. U.S. EPA encourages public comment on the remedial alternatives outlined in the FS report, and will consider those comments when selecting the final remedial action for this site. A glossary of terms used in this Proposed Plan appears on page 13.

II. OPPORTUNITIES FOR PUBLIC INVOLVEMENT

<u>Public Comment Period on the Feasibility Study</u>

U.S. EPA will hold a public comment period from February 12 to March 4, 1988. During this time, interested individuals are encouraged to review the FS report and send written comments to U.S. EPA. A copy of this document, as well as other site-related information, will be located at the following information repository by February 12, 1988:

U.S. Post Office 1365 Ohio Route 14 Deerfield, Ohio 44411 (216) 584-5901	Hours: 7:30 A.M. to 4:30 P.M. Monday through Friday

Interested individuals also are encouraged to review the Administrative Record for the site. It contains the information U.S. EPA will use to select a remedial action for the site. The Administrative Record is also located at the U.S. Post Office in Deerfield.

For more information on the FS, please contact:

Jennifer Hall Community Relations Coordinator (312) 886-4359	**Grace Pinzon** Remedial Project Manager (312) 886-7088

U.S. EPA - Region 5
230 South Dearborn St.
Chicago, Illinois 60604
Toll free number: 1-800-621-8431
(8:30 A.M. to 4:30 P.M. Central Time)

Please send written comments to Jennifer Hall postmarked no later than March 4, 1988.

Public Meeting on the Feasibility Study

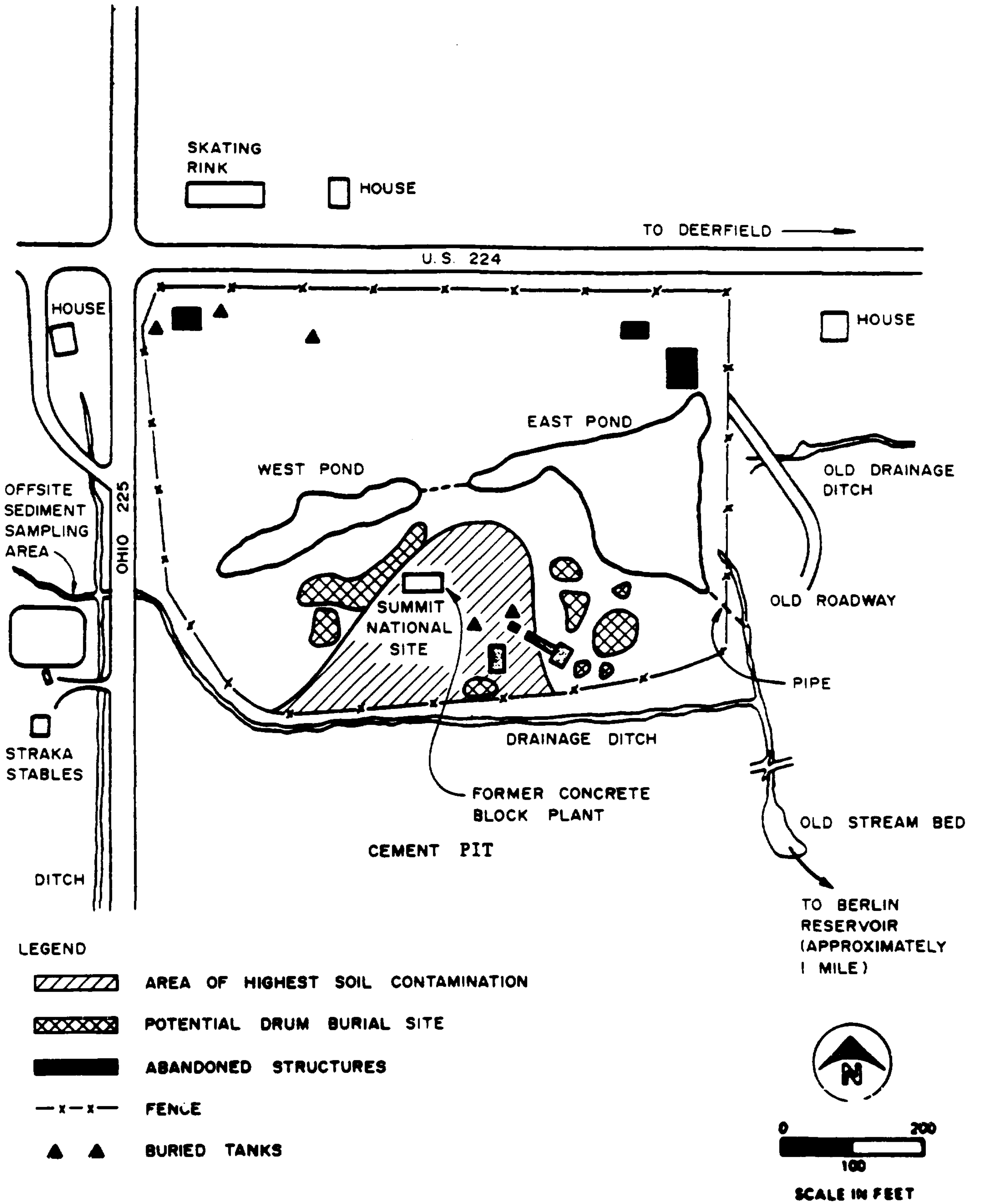
U.S. EPA will hold a public meeting in the community to present the findings of the FS, describe U.S. EPA's preferred remedial alternative, respond to questions, and receive comments.

Date: February 29, 1988
Time: 7:00 P.M.
Location: Deerfield Town Hall
Deerfield, Ohio

III. SITE BACKGROUND

The Summit National site is a former liquid waste disposal facility located on an abandoned coal strip mine at the intersection of Ohio Route 225 and U.S. Route 224 in Deerfield, Ohio. The cities of Youngstown and Cleveland are 20 miles east and 45 miles northwest of the site, respectively. The fenced site, which is rectangular in shape and covers 11.5 acres, contains two ponds, an inactive incinerator, and several vacant buildings (see Figure 1). A summary of historical events related to the site is presented below.

1973 - 1978	**Liquid wastes including oil, resins, sludge, pesticide wastes, and plating wastes are brought to the Summit National site in drums and tank trucks from various manufacturing and chemical companies. These wastes are stored, incinerated, buried, or dumped at the Summit National site.**
June 1974	**Ohio EPA issues an operating permit for a liquid waste incinerator to Summit National Liquid Services.**
June 1975	**Ohio EPA responds to a complaint of an unauthorized waste water discharge from the site. Samples taken by Ohio EPA indicate high levels of hazardous substances in the soil, surface water, and sediment on and near the site.**



NOTE: ALL LOCATIONS OF STRUCTURES AND PHYSICAL FEATURES APPROXIMATE.

SOURCE: MODIFIED FROM USEPA

FIGURE 1
SITE LAYOUT MAP
SUMMIT NATIONAL SITE

June 1978	Ohio EPA orders Summit National to stop receiving waste, and remove all liquid waste stored at the site. No further wastes are received.
August 1979	The State of Ohio files a complaint against Summit National for operating a solid waste disposal facility without a permit, failing to comply with Ohio EPA orders, creating a public nuisance, and failing to notify Ohio EPA about the installation of liquid waste storage and disposal equipment.
Spring - Fall 1980	Ohio EPA constructs a fence around the site, installs a drainage system to control surface water flow onto and off of the site, and installs six ground-water monitoring wells.
September - November 1980	Under authority granted in Section 311 of the Clean Water Act, U.S. EPA removes three liquid waste storage tanks and their contents (7,500 gallons of hazardous waste), and some contaminated soil from the surface of the site.
Fall 1981 - Spring 1982	An agreement is reached between Ohio EPA and eight parties that disposed of waste at the site. These waste generators provide $2.5 million for a surface clean up that involves removing drums, tanks, surface debris, and a small amount of contaminated soil.
September 1983	U.S. EPA places the Summit National site on the National Priorities List (NPL), a federal roster of the nation's uncontrolled or abandoned hazardous waste sites eligible for cleanup under the Superfund program.
Fall 1984 - Winter 1987	U.S. EPA conducts a Remedial Investigation and Feasibility Study at the Summit National site.
March 1987	U.S. EPA temporarily repairs an embankment on the east side of the site to restrict movement of contaminated water and sediment away from the site boundary.
April - May 1987	U.S. EPA diverts surface water overflow from the site, treats it, and discharges it to an off-site impoundment. U.S. EPA also excavates an underground storage tank because of concern that hazardous substances contained in the tank may leak and contaminate the ground water.

IV. RESULTS OF U.S. EPA's REMEDIAL INVESTIGATION

U.S. EPA's evaluation of remedial alternatives is based on information gathered during the Remedial Investigation (RI) -- a series of scientific studies conducted to determine the nature and extent of actual or potential contamination problems related to the site. The RI was conducted in two phases from November 1984 through September 1986. The following paragraphs discuss the RI results.

Ground Water

U.S. EPA installed a total of 29 ground-water monitoring wells during the RI to determine the rate and direction of ground-water flow and sample ground-water quality. U.S. EPA identified three ground-water zones beneath the site: a shallow aquifer at depths ranging from five to 35 feet beneath the site; an intermediate zone of fine-grained rock and soil; and a deeper "Upper Sharon" aquifer at depths greater than 95 feet.

U.S. EPA's sampling showed that the shallow aquifer is contaminated with several organic compounds including benzene, toluene, phenol, trichloroethane, and bis(2-ethyl hexyl) phthalate. The highest level of contamination by organic compounds in the shallow aquifer occurs underneath the southwest corner of the site where a concrete block pit was once used for mixing chemicals. Ground water in this area also shows the highest level of contamination by metals and other inorganic compounds. U.S. EPA's sampling indicated that contamination in the shallow aquifer and the intermediate zone could seep down to the Upper Sharon aquifer.

U.S. EPA tested nine residential wells near the site. All of these wells draw water from the intermediate zone and the Upper Sharon aquifer. U.S. EPA's sampling indicated that these wells have not been contaminated with organic compounds. One well adjacent to the site showed concentrations of the inorganic element barium that were slightly above background levels, but these concentrations did not exceed federal secondary water quality standards. These standards were established to protect the aesthetic qualities of water, such as taste, color, and smell.

Soil

U.S. EPA collected soil samples from the site and from areas beyond the southern and eastern borders of the site to compare contaminant concentrations with background levels. Several organic compounds including VOCs, polychlorinated biphenyls (PCBs), and base neutral acids (BNAs) were found in on-site soil at concentrations above background levels. Soil samples taken from a cement plant south of the site were contaminated with polycyclic aromatic hydrocarbons (PAHs), BNAs, and VOCs that may have originated from the Summit National site. The area around the cement plant also is contaminated with arsenic and barium. Soil samples taken from a residence east of the site were contaminated with inorganic compounds and organic compounds such as PCBs and BNAs.

Surface Water

U.S. EPA sampled on-site surface water to determine the extent of possible contamination. Samples taken from two ponds located on the site showed contamination with organic and inorganic compounds. Eleven VOCs and 14 BNAs were detected in on-site surface water at concentrations above background levels. Sampling also detected 18 inorganic metals in on-site surface water.

Surface water testing from six off-site locations showed contamination by organic and inorganic compounds. The south ditch, which drains some surface water from the site, contained several VOCs. Six VOCs detected in the south ditch were also found in on-site surface water. The lower east ditch also drains surface water from the site and is contaminated with compounds detected at the site. Off-site surface water samples contained a total of 17 inorganic compounds. Similarities between contaminants found on-site and those found off-site indicate that the site is affecting water quality in the adjacent drainage ditches.

Sediment

U.S. EPA compared contaminant concentrations in sediment samples taken downstream of the site (potentially affected by the site) with background soil and sediment samples taken upstream of the site (presumably not affected by the site). This sampling showed that on-site sediment is contaminated with BNAs, PCBs, and inorganic compounds. Off-site samples were contaminated with inorganic compounds and organic compounds including phenols, BNAs, and PCBs.

Air Quality

U.S. EPA monitored air at six locations on the site to determine if contaminants at the site were affecting air quality. Sampling indicated that the site emits low levels of VOCs to the air. However, the levels found were far below federal health and safety standards. U.S. EPA concluded that air contamination would not occur unless there was a surface disturbance of the site.

Buried Material

U.S. EPA found several buried drums and five tanks underneath the site. Samples taken from tanks contained several organic and inorganic compounds. Some of these tanks had leaked their contents to the surrounding soil, potentially affecting ground-water quality. U.S. EPA removed one of the buried tanks in spring 1987. In the RI report, U.S. EPA estimated that there are 900 to 1,600 drums buried underneath the site.

Public Health Evaluation

U.S. EPA conducted a public health evaluation as part of the RI to assess the potential effects that site-related contamination may have on public health. U.S. EPA determined that contamination at the site could pose a potential risk to human health through direct contact with contaminated soil or through ingestion of contaminated ground water.

V. TOWARD A SOLUTION

U.S. EPA conducted a Feasibility Study (FS) at the Summit National site because the RI concluded that contamination at the site could threaten public health and the environment. U.S. EPA developed several alternatives in the FS for addressing contamination at the Summit National site. The remedial alternatives were evaluated based on effectiveness in protecting public health and the environment; compliance with identified state and federal environmental regulations; cost; technical feasibility; short and long-term effectiveness; and reduction of contaminant toxicity, mobility, and volume. The remedial alternatives considered by U.S. EPA are briefly described below. Remedial action technologies appearing in bold are described further beginning on page 11. U.S. EPA's preferred remedial alternative is outlined on page 10.

Remedial Alternative 1 - No Action

U.S. EPA considers a "no action" alternative when evaluating remedial alternatives in the FS to serve as a basis against which the other remedial alternatives can be compared. This alternative states that no further action be taken at the site.

Estimated Total Cost:	$ 0
Estimated Time to Complete:	Not Applicable

Remedial Alternative 2 - Residence Relocation with Monitoring

Remedial Alternative 2 involves relocating a residence from its current location. Relocating this residence would reduce the likelihood of contact with contaminated soil. The exact terms of the relocation will be discussed with the affected parties before a decision is made. Relocation will require the assistance of Ohio EPA and the Federal Emergency Management Agency (FEMA).

Remedial Alternative 2 also involves expanding an existing fence around the site to reduce the possibility of human and wildlife contact with contaminants. Future owners of the site would be prevented from excavating soil, drilling ground-water wells, or disturbing the site in any way that may potentially release contaminants. U.S. EPA would periodically monitor ground water, surface water, and sediment to note any changes in contaminant concentrations that may indicate the need for additional remedial action.

Estimated Total Cost: (in present worth)	$820,000
Estimated Time to Complete:	less than 1 year

<u>Remedial Alternative 3 - Multi-layer Cap and Drum Incineration</u>

This alternative builds on Remedial Alternative 2 by including (1) excavation and off-site incineration of all buried drums, tanks, and their contents; (2) installation of a multi-layer cap over the entire site surface (see Figure 2); (3) excavation of sediment from nearby drainage ditches and placement of the sediment under the multi-layer cap; and (4) demolition of on-site structures. If the demolished debris is contaminated, it will be disposed of at an off-site permitted landfill; if it is uncontaminated, the material will be disposed of underneath the multi-layer cap.

Remedial Alternative 3 also involves installing a slurry wall 40 feet into the soil around the perimeter of the site (see Figure 3). The slurry wall would act as a vertical barrier to reduce the amount of ground water moving from the site. Ground water would be withdrawn from beneath the site through extraction wells and treated on-site along with surface water drained from ponds. The treated water would meet federal and state water quality standards and would be discharged to the drainage ditch south of the site. The southern drainage ditch would be rerouted 100 feet further south to move it away from the identified area of contamination. Near completion of the remedial action, the surface of the site would be regraded and revegetated to control surface water runoff and minimize erosion.

Estimated Total Cost: (in present worth)	$ 15,000,000
Estimated Time to Complete:	Less than 1 year

Remedial Alternatives 2 and 3 are components of each of the following alternatives.

Figure 2

Multi-Layer Cap

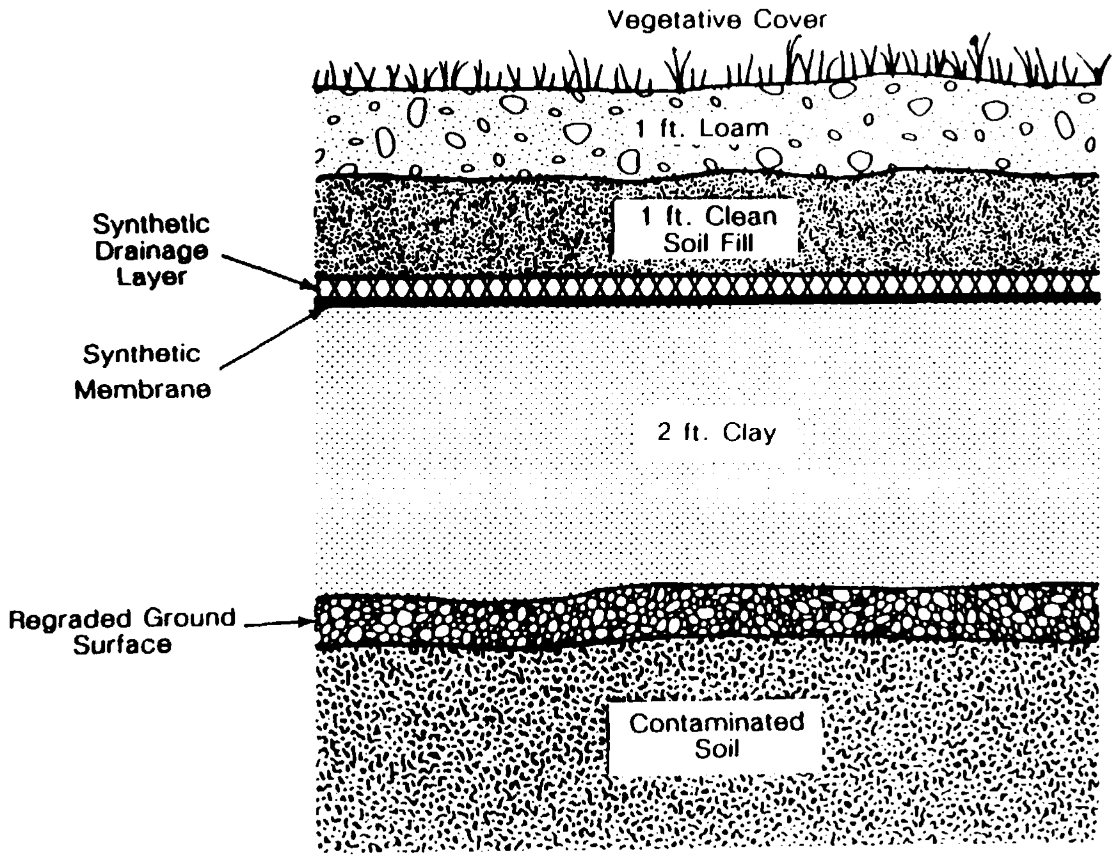
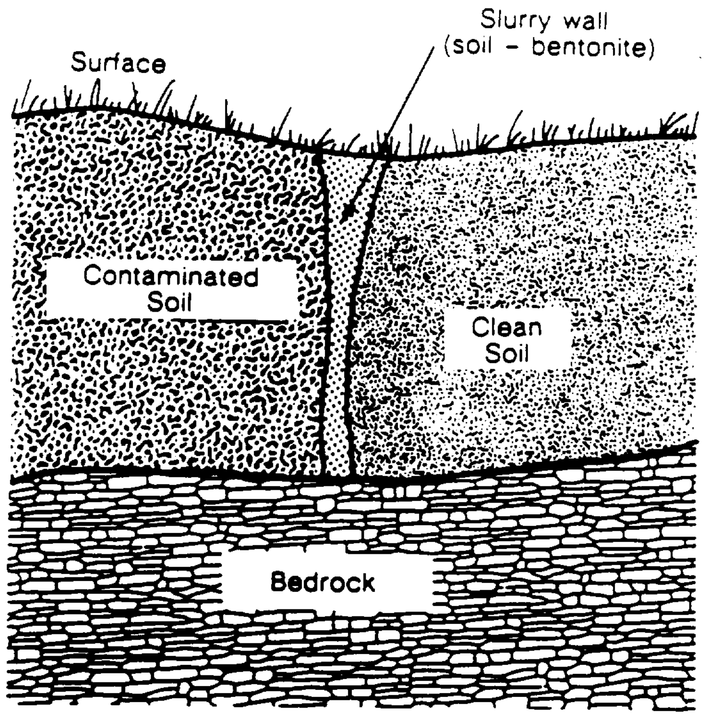


Figure 3
Slurry Wall



Remedial Alternative 4 - On-site RCRA Landfill for Vadose Soil

In addition to the components outlined in Remedial Alternatives 2 and 3, this alternative involves excavating all contaminated Vadose soil (soil that is not saturated with water and lies above the ground-water zone) and sediment from nearby ditches. The excavated soil and sediment would be placed in an on-site lined RCRA landfill. The RCRA landfill would be designed to meet all federal standards, thus blocking the escape of contaminants from the site into the soil or ground water. Typically, a RCRA landfill consists of a two-foot clay bottom layer, two synthetic membrane liners, and a leachate collection system all designed to reduce migration of contaminants from the site.

Estimated Total Cost: (in present worth) — $22,000,000

Estimated Time to Complete: 2 - 3 years

Remedial Alternative 5 - Thermal Treatment of "Hot Spot" Soil

This remedial alternative contains the same components as Remedial Alternatives 2 and 3. However, in addition to drums, tanks and their contents, contaminated sediment from drainage ditches and soil from a highly contaminated area of the site (the contamination "hot spot" located in the southern half of the site) would be incinerated on the site (see Figure 4). An estimated 27,000 cubic yards of soil from the "hot spot" would be excavated and incinerated. Material remaining after soil and sediment incineration would be used to fill in the surface of the site before placement of the cap.

Estimated Total Cost: (in present worth) — $ 24,000,000

Estimated Time to Complete: 5 years

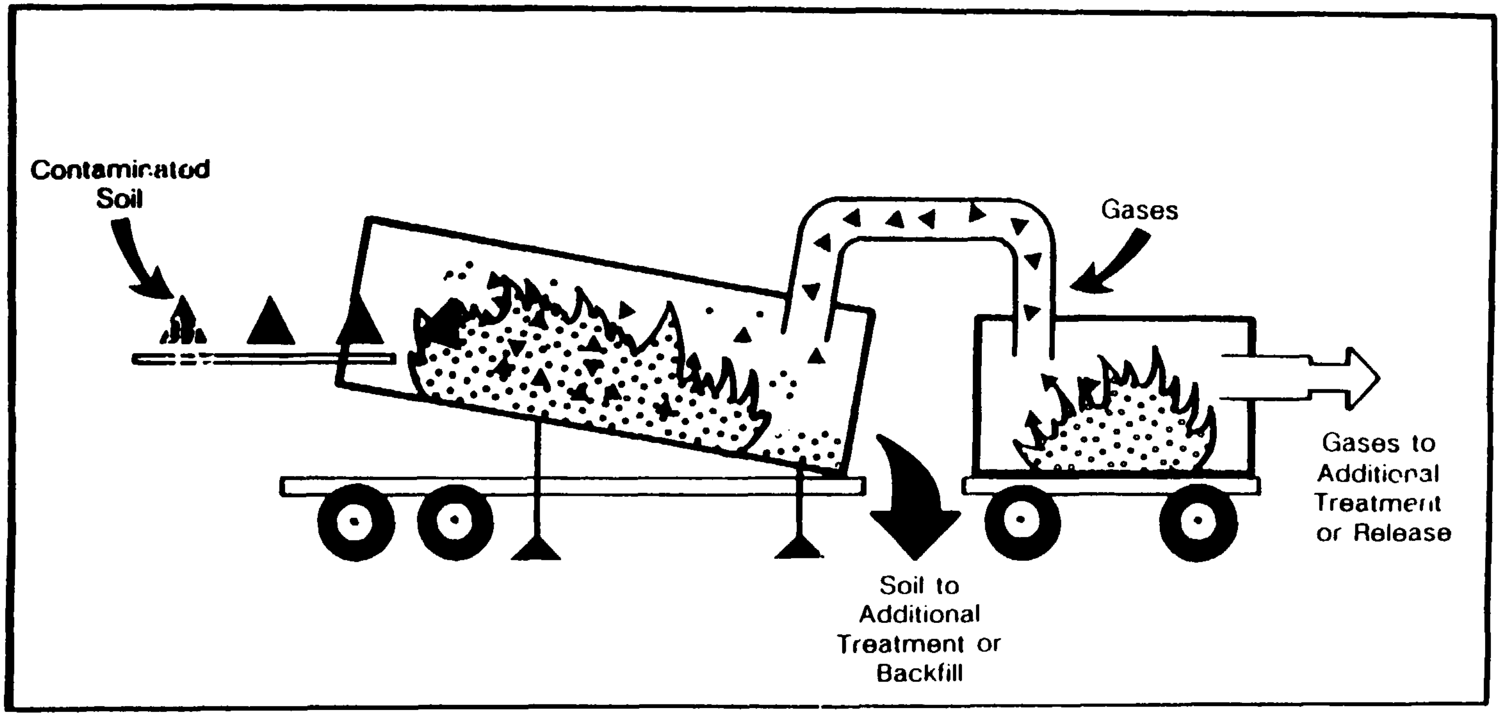
Remedial Alternative 6 - Thermal Treatment of Vadose Soil

This alternative contains the same features as Remedial Alternative 5, except that all contaminated soil above the ground water-zone (rather than soil only in the "hot spot") would be excavated and incinerated on site. Sediment excavated from nearby ditches also would be incinerated. About 105,000 cubic yards of contaminated soil and 1500 cubic yards of contaminated sediment would be excavated and incinerated.

Estimated Total Cost: (in present worth) — $ 46,000,000

Estimated Time to Complete: 9 years

Figure 4
Mobile Incinerator



Remedial Alternative 7 - Thermal Treatment of all Material to Bedrock

This alternative is identical to alternative 5, except that all contaminated soil down to the bedrock layer (approximately 40 feet beneath the surface) would be excavated and incinerated on site. Excavation to this depth would amount to an estimated 430,000 cubic yards of material. Moreover, drums, tanks, and contaminated sediment also would be incinerated on site rather than off site. Material remaining after incineration would be placed in an on-site RCRA landfill.

Removal of contaminated material down to the bedrock layer would eliminate the need for ground-water extraction wells in this zone. Contaminated ground water in the upper bedrock layer would be extracted and treated.

Estimated Total Cost: (in present worth)	$ 127,000,000
Estimated Time to Complete:	12 years

Remedial Alternative 8 - In-Place Vitrification of "Hot Spot" Soil

This alternative is the same as Remedial Alternative 5, with three exceptions. First, rather than being excavated and incinerated, contaminated soil from the "hot spot" area would be treated in-place through a process called **vitrification**; second, buried drums, tanks and their contents would be incinerated at an off-site location rather than being treated on-site; and third, sediment would be excavated and placed under the multi-layer cap.

Estimated Total Cost: (in present worth)	$ 27,000,000
Estimated Time to Complete:	2 years

Remedial Alternative 9 - In-Place Vitrification of Vadose Soil

This remedial alternative includes all the features of Remedial Alternative 8 except that all vadose soil (approximately 105,000 cubic yards of soil) would be treated in-place through vitrification as opposed to soil only in the "hot spot" area. Also, approximately 1500 cubic yards of contaminated sediment would be excavated from nearby ditches and vitrified on the site.

Estimated Total Cost: (in present worth)	$ 39,000,000
Estimated Time to Complete:	7 years

VI. U.S. EPA's PREFERRED REMEDIAL ALTERNATIVE

In selecting an alternative that best addresses contamination at the site, U.S. EPA made its recommendation based on the following criteria: effectiveness in protecting public health and the environment; compliance with identified state and federal environmental regulations; cost; technical feasibility; short and long-term effectiveness; implementability (reliability, availability, and administrative feasibility); and reduction of contaminant toxicity, mobility, and volume. State and community acceptance will be evaluated following the public comment period. This evaluation will help to determine the final selection of the preferred alternative for the Summit National site. Based on the findings of the RI and FS, U.S. EPA prefers Remedial Alternative 5, which includes the following activities:

- Limiting access and future site uses;
- Monitoring ground water and surface water;
- Demolishing on-site structures and placing the debris in an off-site permitted landfill or underneath the multi-layer cap;
- Excavating and incinerating buried drums, tanks and their contents, sediment, and "hot spot" soil;
- Placing incinerated material in an on-site RCRA landfill;
- Installing a multi-layer cap over the entire site surface;
- Extracting ground water and treating the water on-site;
- Removing and treating all surface water from the site;
- Installing a slurry wall to reduce off-site movement of contaminated ground water;
- Regrading and revegetating the site surface to reduce the amount of surface water flowing onto the site and minimize erosion; and
- Relocating an adjacent residence from its current location.

Estimated Total Cost: (in present worth)	$ 24,000,000
Estimated Time to Complete:	5 years

VII. DESCRIPTION OF REMEDIAL TECHNOLOGIES

Incineration

Incineration involves using extremely high temperatures to break hazardous organic substances down into their very basic elements such as carbon, nitrogen, and hydrogen. Incineration can take place at a licensed, permanent facility or on a hazardous waste site using a mobile incinerator. Elements produced after initial treatment of contaminated material are further treated to make safer compounds such as water, carbon dioxide, and nitrogen oxides. Some gas is produced through the incineration process, but it is treated to meet federal air quality standards before being released to the atmosphere. Also, an ash residue remains after material is incinerated. This ash is tested and disposed of in a permitted landfill; or, as is the case for on-site incineration at the Summit National site, ash could be placed in a RCRA landfill on the site. Properly done, high-temperature incineration is a safe, efficient, odorless, and smokeless process that renders most toxic organic waste permanently harmless.

Vitrification

Vitrification involves installing four electrodes in the soil, and passing an electric current between the electrodes through the soil. The electric current creates temperatures high enough to melt the soil. As the highest temperatures are reached, organic compounds are destroyed or volatilized (i.e., changed from a liquid to a gas). Any organic compounds that volatilize during this process are collected and treated if needed. Inorganic compounds are distributed throughout the molten soil. When the soil cools, a solid, glassy mass is produced. Inorganic compounds are trapped in the solid mass.

Multi-layer cap

A multi-layer cap consists of a vegetative cover, one foot of loam (a mixture of clay, silt, and sand), a second foot of soil, a drainage layer, an impermeable synthetic layer, and two feet of clay (see Figure 3). A multi-layer cap restricts the amount of rain water seeping down to contaminated soil. By reducing the amount of water coming into contact with contaminated soil, off-site migration of contaminated ground water would be less likely.

Water Treatment

Water is treated on-site using a series of chemical and physical processes that involve the use of lime to remove metals, sand filters to remove suspended solids, and carbon adsorption to remove organic compounds. Carbon adsorption involves actively binding organic contaminants to carbon particles in the same sense as a magnet adheres to a metal surface, thus removing organic compounds from the water.

Slurry Wall

A slurry wall is an underground wall made of an almost impermeable material that encircles the area of contamination. At the Summit National site, a layer of non-porous soil and bentonite (a clay rock) would be installed to depths of 40 feet. This wall would restrict contaminants from migrating off the site.

APPENDIX A

GLOSSARY

Arsenic	An inorganic metal used extensively in insecticides and weed killers because of its highly toxic character. Arsenic is also used in the manufacture of glass, metal alloys, and wood preservatives. Arsenic occurs naturally, and has been found in sea water, spring water, and in association with mineral deposits of silver and antimony.
Aquifer	An underground rock or soil formation capable of yielding water in quantities suitable for domestic, agricultural, and industrial uses.
Background Level	The concentration of a particular chemical in the soil, water, or air considered to be within the natural range for that chemical. Once background levels are determined, U.S. EPA can compare background levels with chemical concentrations found at suspected hazardous waste sites to help determine if a contamination problem exists.
Barium	An inorganic metal element. Pure barium does not occur naturally. Barite, however, does occur naturally and is made of barium, sulfur, and oxygen. Barium compounds are used in medicine.
Bis (2-ethyl hexyl) phthalate	An organic compound used as a solvent and plasticizer. This compound has been shown to cause liver tumors in laboratory animals.
Base Neutral Acids (BNAs)	A group of organic compounds that do not evaporate readily.
Benzene	A highly flammable organic compound used as a solvent, and in the manufacture of dyes, varnishes, and lacquers. Ingestion or inhalation of benzene at elevated levels can irritate the lining of the respiratory and digestive systems, and can cause restlessness, convulsions, and cancer.
Ground Water	Water that fills the spaces between soil, sand, rock, and gravel particles beneath the Earth's surface. Rain that does not immediately flow to streams and rivers slowly percolates through soil to the point of saturation forming ground-water reservoirs. Ground water typically flows at a very slow rate, as compared with surface water, along gradients that lead to river systems.

Inorganic Compounds	A class of chemical compounds that do not contain carbon. Water, table salt, and ammonia are examples of some inorganic compounds.
Metals	A group of inorganic elements that includes, for example, barium, lead, cadmium, zinc, and aluminum.
Monitoring Wells	Special wells drilled into the Earth to sample ground water.
Organic Compounds	A class of carbon containing compounds. Petroleum and pesticides are examples of some materials containing organic compounds.
Phenol	A group of organic compounds widely used as solvents and in rubber products. In very low concentrations, phenols can cause taste and odor problems in water. In high concentrations, phenols can be toxic to living systems.
Polychlorinated Biphenyls (PCBs)	A group of organic compounds used since 1926 in electric transformers as insulators and coolants, as well as in lubricants, carbonless paper, adhesives, and caulking compounds. PCBs degrade very slowly in the environment and can be accumulated and stored in the fatty tissues of animals and humans. U.S. EPA banned the general use of these compounds in 1979. PCBs can cause liver damage and have been shown to cause cancer in laboratory animals.
Polycyclic Aromatic Hydrocarbons (PAHs)	A group of organic compounds produced as waste products in the combustion of fossil fuels, cigarettes, and wood. Some PAHs are known to cause cancer.
Present Worth	An economic term used to describe today's cost of a Superfund cleanup that reflects the discounted value of future costs. For this site, U.S. EPA used a discount rate of 10 percent when estimating the present worth of future costs for each of the remedial alternatives.
Remedial Action	A series of cleanup steps taken to control human health and/or environmental hazards posed by a hazardous waste site.
Remedial Investigation/ Feasibility Study (RI/FS)	A two part study that must be completed before a Superfund cleanup can begin. The first part, the Remedial Investigation (RI), examines the nature and extent of contamination. The RI is sometimes a phased process, as has occurred at the Summit National site. The Feasibility Study (FS), evaluates possible alternatives for addressing contamination problems. Through this evaluation of alternatives, U.S. EPA is able to identify its preferred remedial alternative.

Sediment	Decomposing animals and plants, mud, sand, and soil which settle to the bottom of streams, lakes, rivers, or ponds.
Surface Water	Standing or flowing water bodies located on the ground surface such as streams, rivers, lakes, or ponds.
Toluene	An organic compound used in solvents, medicine, dyes, aviation gasoline, and explosives. Toluene is flammable and explosive and can be toxic when ingested, inhaled, or absorbed through the skin.
Trichloro-ethane	An organic compound used as a solvent and as a degreaser. Exposure to trichloroethane over long periods of time may cause cancer.
Vadose Soil	Soil that is not saturated with water and thus lies above the ground-water zone.
Volatile Organic Compounds (VOCs)	Organic compounds that readily vaporize at room temperatures.